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E I DU PONT DE NEMOURS AND COMPANY
LEGAL PATENT RECORDS CENTER
BARLEY MILL PLAZA 25/1122B
4417 LANCASTER PIKE
WILMINGTON, DE 19805

EXAMINER	
PIZIALI, ANDREW T	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/803,384
Filing Date: March 18, 2004
Appellant(s): ZHU, REIYAO

Andrew Golian
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/2/2007 appealing from the Office action mailed 11/7/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings that will directly affect or be directly affected by or have a bearing on the Board's decision.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6a) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct expect for the following:

(6b) Grounds of Rejection Withdrawn

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner in view of appellant's arguments:

1) Claims 1, 3-5, 11, 13-17 and 19 are no longer rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,865,906 to Smith in view of USPN 4,025,491 to Nelson.

2) Claims 6-10 and 18 are no longer rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,865,906 to Smith in view of USPN 4,025,491 to Nelson and further in view of USPN 5,824,614 to Gadoury.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,787,228	CAMPBELL	9-2004
4,025,491	NELSON	5-1977
4,865,906	SMITH, JR.	9-1989
5,824,614	GADOURY	10-1998
4,970,111	SMITH, JR.	11-1990

(9) Grounds of Rejection Maintained By The Examiner

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 11, 13-14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,787,228 to Campbell in view of USPN 4,025,491 to Nelson.

Regarding claims 1, 11, 13-14 and 19, Campbell discloses a yarn suitable to provide arc

and flame protection comprising modacrylic fibers and aramid fibers (see entire document including column 1, lines 13-17 and column 4, lines 9-56). Campbell discloses that the yarn may comprise at least about 70 weight percent modacrylic fibers (about 70% is considered to read on 60%) and at least about 3 weight percent aramid (column 4, lines 9-56).

Campbell does not specifically mention the addition of cotton fibers, but Nelson discloses that it is known in the flame resistant fabric art to blend synthetic fibers with between 15 to 65 weight percent cotton to provide the fabric with the desired aesthetic hand properties, moisture absorption properties, and to minimize static electricity (see entire document including column 1, lines 62-66 and the paragraph bridging columns 4 and 5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add between 15 to 65 weight percent cotton fibers to the yarn, because the cotton fibers provide the yarn with the desired aesthetic hand properties, moisture absorption properties, and to minimize static electricity.

In the event that it is shown that about 70% does not read on 60%, Campbell also discloses that modacrylic fibers are present for flame resistance (column 3, lines 18-23) while the aramid fibers are present for tensile strength (column 3, lines 25-40). Nelson also discloses that it is known in the flame resistant fabric art to blend synthetic fibers with between 15 to 65 weight percent cotton to provide the fabric with the desired aesthetic hand properties, moisture absorption properties, and to minimize static electricity. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the amount of modacrylic fibers, such as below 70 weight percent, to provide the yarn with more cotton fibers and/or aramid fibers, because it is understood by one of ordinary skill in the art that the weight

percent of modacrylic, cotton, and aramid fibers determines properties such as flame resistance, tensile strength, aesthetic hand properties, moisture absorption properties, and static electricity properties, and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

In re Geisler, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997) (Applicant argued that the prior art taught away from use of a protective layer for a reflective article having a thickness within the claimed range of "50 to 100 Angstroms." Specifically, a patent to Zehender, which was relied upon to reject applicant's claim, included a statement that the thickness of the protective layer "should be not less than about [100 Angstroms]." The court held that the patent did not teach away from the claimed invention. "Zehender suggests that there are benefits to be derived from keeping the protective layer as thin as possible, consistent with achieving adequate protection. A thinner coating reduces light absorption and minimizes manufacturing time and expense. Thus, while Zehender expresses a preference for a thicker protective layer of 200-300 Angstroms, at the same time it provides the motivation for one of ordinary skill in the art to focus on thickness levels at the bottom of Zehender's 'suitable' range- about 100 Angstroms- and to explore thickness levels below that range. The statement in Zehender that '[i]n general, the thickness of the protective layer should be not less than about [100 Angstroms]' falls far short of the kind of teaching that would discourage one of skill in the art from fabricating a protective layer of 100 Angstroms or less. [W]e are therefore 'not convinced that there was a sufficient teaching away in the art to overcome [the] strong case of obviousness' made out by Zehender.").

Regarding claims 11, 13-14 and 19, Campbell discloses that the yarn may be used to form fabrics, such as apparel (column 7, lines 12-17).

Regarding claims 13 and 14, considering that the fabric taught by the prior art is substantially identical to the claimed yarn in terms of constituents and constituent weight percentages, it appears that the fabric would inherently possess the claimed char length.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

3. Claims 3-5 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,787,228 to Campbell in view of USPN 4,025,491 to Nelson as applied to claims 1, 11, 13-14 and 19 above, and further in view of USPN 4,865,906 to Smith.

Campbell discloses a yarn suitable to provide arc and flame protection comprising modacrylic fibers and aramid fibers (see entire document including column 1, lines 13-17 and column 4, lines 9-56), but Campbell does not specifically mention the use of both meta-aramid and para-aramid fibers. Smith discloses that it is known in the flame resistant fabric yarn art to include from 22 to 100 weight percent meta-aramid fibers and from 0 to 78 weight percent para-aramid fibers, on the basis of total aramid fiber, to produce a yarn with desired handle (see entire

document including column 2, lines 38-42 and column 3, lines 15-30). It would have been obvious to one having ordinary skill in the art at the time the invention was made to include from 22 to 100 weight percent meta-aramid fiber and from 0 to 78 weight percent para-aramid fiber, on the basis of total aramid fiber, because the yarn would possesses a desirable handle for comfort while also possessing the desired tensile strength.

4. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,787,228 to Campbell in view of USPN 4,025,491 to Nelson in view of USPN 4,865,906 to Smith as applied to claims 3-5 and 15-17 above, and further in view of USPN 5,824,614 to Gadoury.

Campbell does not specifically mention an anti-static component, but Gadoury discloses that it is known in the flame resistant yarn art to include carbon and/or metal fibers (see entire document including column 8, lines 40-59). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add carbon and/or metal fibers to the yarn, because the fibers would provide anti-static properties.

5. Claims 9-10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,787,228 to Campbell in view of USPN 4,025,491 to Nelson as applied to claims 1, 11, 13-14 and 19 above, and further in view of USPN 5,824,614 to Gadoury.

Campbell does not specifically mention an anti-static component, but Gadoury discloses that it is known in the flame resistant yarn art to include carbon and/or metal fibers (see entire document including column 8, lines 40-59). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add carbon and/or metal fibers to the yarn, because the fibers would provide anti-static properties.

(10) Response to Argument

Part 1A- Rejection Under 35 U.S.C §103(a) based on U.S. Patent No. 6,787,228 to Campbell in view of U.S. Patent No. 4,025,491 to Nelson.

The appellant asserts that 70% by weight modacrylic fibers is the lower limit set by Campbell to obtain the desired flame resistance. The examiner respectfully disagrees. Campbell discloses that the level of flame resistance is based upon the acrylonitrile unit weight percentage of the yarns (column 3, lines 18-21). Campbell teaches that 70% by weight modacrylic fiber is the lower limit when 50% by weight acrylonitrile units are present (column 4, lines 17-21, claim 5, claim 15, and claim 29). To paraphrase, Campbell teaches that at least 35% (50% of 70%) by weight acrylonitrile units are necessary in the overall yarn composition to obtain the desired flame resistance. Since Campbell discloses that the modacrylics may have between 35% to 85% by weight acrylonitrile units (column 4, lines 15-17), when the acrylonitrile unit weight percentage is 85%, Campbell teaches that only 42% by weight modacrylic fibers will be necessary to achieve the desired flame resistance (because 42% of 85% = 35%). To summarize, Campbell teaches that 42% to 97% by weight modacrylic fibers may be present to obtain the desired flame resistance.

The appellant also states that one of ordinary skill in the art would not be motivated to employ 60% modacrylic fibers, but appellant's actual argument is based on the premise that Campbell would not be motivated to employ 60% modacrylic fibers because Campbell discloses that the fabric desirably meets the American Society for Testing and Materials standard for flame resistance. The appellant clearly fails to appreciate that the problem motivating the patentee is only one of many addressed by the patent's subject matter. The question is not whether the

combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

Therefore, even assuming *arguendo*, that Campbell fails to disclose the claimed modacrylic weight percentage with sufficient specificity, Campbell discloses that modacrylic fibers are present for improved flame resistance and dying capability, aramid fibers are present for improved strength and energy absorption (column 3, lines 17-40 and column 4, lines 35-40), and Nelson discloses that cotton fibers provide the improved aesthetic hand properties, moisture absorption properties, and to minimize static electricity (column 1, lines 62-66 and the paragraph bridging columns 4 and 5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the amount of modacrylic fibers, such as to 60 weight percent, to provide the yarn with more cotton fibers and/or aramid fibers, because some applications desire higher strength, higher energy absorption, improved aesthetic hand properties, improved moisture absorption properties, and/or minimal static electricity over the benefits (higher flame resistance and higher dying capability) of more modacrylic fibers and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

The applied prior art clearly discloses that there are benefits to be derived from reducing the weight percent of modacrylic fibers. A reduced weight percent of modacrylic fibers, and thus an increase in the weight percent of aramid fibers and/or cotton fibers, would result in higher strength, higher energy absorption, improved aesthetic hand properties, improved

moisture absorption properties, and/or minimal static electricity. Campbell falls far short of the kind of teaching that would discourage one of ordinary skill in the art from fabricating a yarn comprising 60 weight percent modacrylic fibers.

***In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997)**

(Applicant argued that the prior art taught away from use of a protective layer for a reflective article having a thickness within the claimed range of "50 to 100 Angstroms." Specifically, a patent to Zehender, which was relied upon to reject applicant's claim, included a statement that the thickness of the protective layer "should be not less than about [100 Angstroms]." The court held that the patent did not teach away from the claimed invention. "Zehender suggests that there are benefits to be derived from keeping the protective layer as thin as possible, consistent with achieving adequate protection. A thinner coating reduces light absorption and minimizes manufacturing time and expense. Thus, while Zehender expresses a preference for a thicker protective layer of 200-300 Angstroms, at the same time it provides the motivation for one of ordinary skill in the art to focus on thickness levels at the bottom of Zehender's 'suitable' range- about 100 Angstroms- and to explore thickness levels below that range. The statement in Zehender that '[i]n general, the thickness of the protective layer should be not less than about [100 Angstroms]' falls far short of the kind of teaching that would discourage one of skill in the art from fabricating a protective layer of 100 Angstroms or less. [W]e are therefore 'not convinced that there was a sufficient teaching away in the art to overcome [the] strong case of obviousness' made out by Zehender.").

The appellant also asserts that there is no motivation to add cotton fibers to the yarn, as taught by Nelson, because Nelson discloses that hydrophilic (cotton) fibers have poorer fire-retardant properties than polyester fibers and that there is a need for polyesters having high concentrations of fire-retardants (paragraph bridging columns 1 and 2). The examiner respectfully disagrees with appellant's logic. Nelson clearly discloses that it is known in the flame resistant fiber art to add cotton fibers to provide the fiber with the desired aesthetic hand properties, moisture absorption properties, and to minimize static electricity (see entire document including column 1, lines 62-66 and the paragraph bridging columns 4 and 5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add cotton fibers to the yarn, as taught by Nelson, because the cotton fibers would provide the fire-retardant yarn with the desired aesthetic hand properties, moisture absorption properties, and minimized static electricity and because some applications desire hand properties, moisture absorption properties, and/or minimized static electricity properties over increased fire-retardant properties.

A patent for a combination, which only unites old elements with no change in their respective functions, obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men. Where the combination of old elements performed a useful function, but it added nothing to the nature and quality of the subject matter already patented, the patent failed under §103. When a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious.

The substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); In re Ruff 118 USPQ 343 (CCPA 1958). When a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.

The appellant asserts that the examiner has ignored Nelson's disclosure of adding a high concentration of fire retardants to a polyester. The examiner contends that cotton fibers would provide the fire-retardant yarn of Campbell with the desired aesthetic hand properties, moisture absorption properties, and/or minimized static electricity, regardless of Nelson's disclosure of adding a high concentration of fire retardants to a polyester.

The appellant asserts that Nelson is nonanalogous art because cotton possesses poorer fire-retardant properties than polyethylene terephthalate fibers and because Nelson mentions self extinguishing fibers. In response to appellant's argument that Nelson is nonanalogous art, it has been held that a prior art reference must either be in the field of appellant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Nelson is in the field of appellant's endeavor, which is fire/flame retardant fibers.

Part I B - Rejection Under 35 U.S.C. §103(a) based on U.S. Patent No. 6,787,882 to Campbell in view of U.S. Patent No. 4,025,491 to Nelson further in view of U.S. Patent No. 4,865,906 to Smith, Jr.

The above arguments are substantially repeated.

Part 1 C - Rejection Under 35 U.S.C. §103(a) based on U.S. Patent No. 6,787,882 to Campbell in view of U.S. Patent No. 4,025,491 to Nelson in view of U,S. Patent No. 4,865,906 to Smith, Jr., further in view of U.S. Patent No- 5,824,614 to Gadoury.

The above arguments are substantially repeated.

Part I D - Rejection Under 35 U.S.C. §103(a) based on U.S. Patent No. 6,787,882 to Campbell in view of U.S. Patent No. 4,025,491 to Nelson, further in view of U.S. Patent No. 5,824,614 to Gadoury.

The above arguments are substantially repeated.

Part II A- Rejection Under 35 U.S.C. §103(a) based on U.S. Patent U.S. Patent No. 4,865,906 to Smith, Jr., in view of No. 4,025,491 to Nelson.

The ground of rejection is not presented for review on appeal because they have been withdrawn by the examiner in view of appellant's arguments.

Part II B - Rejection Under 35 U.S.C. §103(a) based on U.S. Patent No. 4,865,906 to Smith in view of Nelson applied to claim 1, 3-5, 11, 13-17 and 19 further in view of U.S. Patent No. 5,824,6t4 to Gadoury.

The ground of rejection is not presented for review on appeal because they have been withdrawn by the examiner in view of appellant's arguments.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Andrew T Piziali/
Primary Examiner, Art Unit 1794

Conferees:

/Terrel Morris/
Terrel Morris
Supervisory Patent Examiner
Group Art Unit 1794

/Jennifer Michener/
Jennifer Michener
Quality Assurance Specialist, TC1700